Game Changing Development

Flight Qualification of Busek's 5N Green Monopropellant Thruster

Completed Technology Project (2015 - 2017)

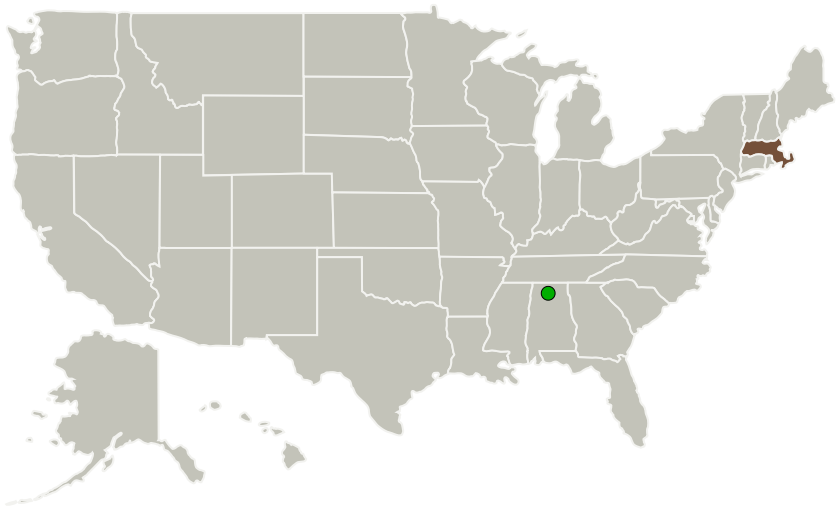
Project Introduction

NASA will test a Busek 5N flight-like thruster which is designed to operate on AF-M315E; a non-toxic monopropellant. Testing will consist of performance, life and plume diagnostics at altitude to simulate space conditions. Key data will include Raman Spectroscopy and Schlieren imaging to study the plume species relative concentrations, temperature, velocity, and structure.

Anticipated Benefits

Green Propellant is a less toxic and higher performance propellant for next-generation launch vehicles and spacecraft that may offer many advantages including longer mission durations, additional maneuverability, increased payload space and simplified launch processing, for future satellites.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Busek Company, Inc.

Responsible Program:

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Organizations Performing Work	Role	Type	Location
Busek Company, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Natick, Massachusetts
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations
Massachusetts

Project Transitions

November 2015: Project Start

September 2017: Closed out

Closeout Summary: Testing completed at both GRC and MSFC. GRC not able t o take test to end of life due to hardware valve) and operational issues. Schliere n analysis of combustion plume was able to detect aerosol formation but not sho ck waves. Raman spectral analysis was inconclusive. Testing at MSFC halted aft er in-test anomaly resulted in mechanical failure of valve at the end of the Burn- in phase. TRL elevated to 4 or 5 (not 6 since testing in a relevant environment w as not completed).

Project Management

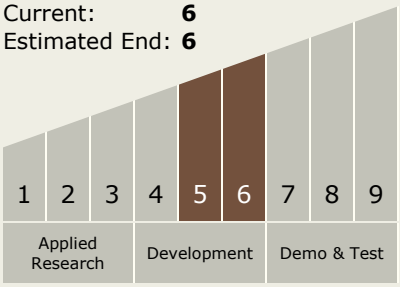
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
Timothy D Smith

Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



Target Destination

Foundational Knowledge